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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,935	12/30/2003	Aaron T. Deever	87209RLW	1924

7590 07/24/2008

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EXAMINER	
KOZIOL, STEPHEN R	
ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
07/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/748,935	DEEVER, AARON T.	
	Examiner	Art Unit	
	STEPHEN R. KOZIOL	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. In view of the Appeal Brief filed on 04/28/2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Samir A Ahmed/.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.
>
> Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.
>
> … a signal does not fall within one of the four statutory classes of Sec. 101.
>
> … signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claim 16 is rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 16 is drawn to a computer program product comprising functional descriptive material recorded on a computer readable medium. Normally, the claim would be statutory. However, the specification, at paragraph 0058 defines or exemplifies the claimed computer readable medium as encompassing statutory media such as a "ROM," "RAM," "optical drives," etc., as well as non-statutory subject mater such as a "carrier wave."

"A transitory, propagating signal … is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007)).

Because the full scope of the claim as properly read in light of the disclosure appears to encompass non-statutory subject matter (i.e., because the specification defines/exemplifies a computer readable medium as a non-statutory carrier waver) the claim as a whole is non-statutory. The examiner suggests amending the claim to *include* the disclosed tangible computer readable storage media, while at the same time *excluding* the intangible transitory media such as signals, carrier waves, etc. Any amendment to the claim should be commensurate with its corresponding disclosure.

One possible way to overcome the present 35 U.S.C. § 101 rejection may be to amend paragraph 0058 of the specification to delete the intangible transitory media such as carrier waves.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;
c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

5. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joshi et al. U.S. Patent No. 6,668,090 B1 ("Joshi") in view of Nafarieh, U.S. Patent No. 6,252,994 B1 ("Nafarieh").

Regarding Claim 1, Joshi discloses a method for encoding digital image data, said method comprising the steps of:

1. transforming the digital image data using a subband decomposition to produce a plurality of subbands, each said subband having a plurality of subband coefficients *(see Joshi , Figures 1 and 2, as described in column 5 line 56 thru column 6 line 13)*
2. quantizing said subband coefficients of each said subband according to said quantization step-size set of said base image type to provide quantized coefficients *(see Joshi Figure 2 item 206, also Figure 3 item 301, as introduced in column 5 lines 27-30 and further detailed in column 5 line 56 thru column 6 line 13);*

3. partitioning each said subband into a plurality of codeblocks *(see Joshi Figure 2, also, column 5 lines 22-55);*
4. forming one or more bitplanes from said quantized coefficients of each said codeblock of each said subband *(see Joshi Figure 2, also, column 2 lines 47-52*); and
5. discarding at least part of one of said bitplanes having a discard parameter in a predetermined range, said discard parameter being a function of the assigned step-size set of the respective said codeblock *(see Joshi Figure 2, also, column 6 lines 18-41).*

Joshi does not sufficiently teach: defining a base image type and a plurality of higher level image types of said digital image data, each said image type having a preassigned one of a plurality of quantization step-size sets, and assigning each said codeblocks one of said image types and a corresponding quantization step-size set to provide respective assigned step-size sets.

However, Nafarieh teaches a similar JPEG-compliant, adaptive quantization system. Nafarieh's system recognizes the benefit of assigning an image type to each of the codeblocks to allow each block to be reconstructed with minimal perceptual error (see Nafarieh, column 4 lines 9-25). Accordingly, Nafarieh teaches: assigning each said codeblocks one of said image types and a corresponding quantization step-size set to provide respective assigned step-size sets *(see Nafarieh column 7 lines 25-47 as shown in Figures 4 and 5).* Nafarieh further teaches defining a base image type and a plurality of higher level image types of said digital image data, each said image type having a preassigned one of a plurality of quantization step-size sets *(see Nafarieh Figures 4 and 5 and column 7 lines 1-13 and column 4 line 50 through column 5 line 12),*

One of ordinary creativity and skill in the image processing arts the time of the present application would have looked to Nafarieh to improve upon the basic quantization system of

Joshi by incorporating Nafarieh's use of adaptive quantization of codeblocks based on an image type for the benefit of reconstructing codeblocks with minimal perceptual error. The ordinarily-skilled artisan would have found it obvious to incorporate Nafarieh's image type based adaptive quantization into Joshi's basic quantization system to achieve a more efficient adaptive quantization system.

See *KSR International Co. v. Teleflex Inc.* 550 U.S. ____ (2007), *"A person of ordinary skill is also a person of ordinary creativity, not an automaton."*

Regarding Claim 3, Joshi discloses encoding the quantized coefficients of each codeblock (fig 3/items 301 thru 303, also, col. 5 ln. 55-67).

Regarding Claim 9, Joshi discloses encoding said quantized coefficients of each of said codeblocks in a plurality of coding passes, each said coding pass generating a partial-bitplane, said partial-bitplanes of each said codeblock together defining a respective bitplane; and said discarding further comprises discarding at least one partial-bitplane (fig. 2, also, col. 6 ln. 18-42).

Regarding Claim 10, Joshi discloses the encoding of said quantized coefficients of each of said codeblocks in a plurality of coding passes further comprises entropy encoding (fig 3/item303).

Claims 16 and 17 have been analyzed and are rejected for the reasons outlined in response to claim 1 above because the core limitations claims 16 and 17 recite are nearly identical in scope to those found in claim 1, despite those limitations taking different embodiments.

Regarding Claim 19, Joshi discloses an image encoder with a discard unit that tells the encoder which bitplanes to discard, causing the encoder to discard those bitplanes from further encoding (fig. 2/items 206 thru 215, also, col. 6 ln. 18-42).

Regarding Claim 20, Joshi discloses an encoder further comprising a bit-stream organizer for combining partial-bitplanes into a bit-stream (fig. 2/item 215, also, col. 5 ln. 42-48).

Regarding Claim 21, Joshi discloses an encoder further capable of forming said partial-bitplanes from said quantized coefficients of each said codeblock of each said subband and encoding all of said coefficients; and said discard unit communicates said discardable partial-bitplanes to said bit-stream organizer, which excludes said discardable partial-bitplanes from said bit-stream (fig. 2, also, col 5 ln. 12-55).

Regarding Claim 22, Joshi discloses the image encoder is an entropy encoder (fig 3 /item303).

Regarding claim 2, Joshi and Nafarieh are silent on the limitation of: the base image type is preassigned the smallest quantization step-size. However, Official Notice is taken that both the concept and advantage of defining a base image and assigning the base image the smallest quantization step size are notoriously well known and expected in the art, and therefore would have been obvious to incorporate in the adaptive image quantization method of Joshi and Nafarieh to achieve a more efficient adaptive quantization system.

Regarding claim 4-5, Joshi and Nafarieh are silent on discarding bitplanes prior to or after encoding the image. However, Official Notice is taken that both the concept and advantage of discarding bitplanes within a predetermined discard range either before or after the encoding of an image are notoriously well known and expected in the art, and therefore would have been obvious to incorporate in adaptive image quantization method of Joshi and Nafarieh to achieve a more efficient adaptive quantization system.

Regarding claim 6-8, Joshi and Nafarieh are silent on the image encoding method further comprising

1. associating an image type with each image coordinate contributing to each codeblock
2. discard parameters that are a function of said image types
3. mapping said coordinated into a plurality of influence regions
4. subband coefficients defining resultant pixels.

However, Official Notice is taken that it would have been obvious to one of ordinary skill in the art at the time of the invention of to employ the above steps 1-4 as claimed in claims 6-8 for codeblock compression and subband coefficient formation for the benefit of discarding unnecessary bitplanes.

Regarding claim 11 and 23, Joshi and Nafarieh are silent on using an arithmetic binary encoder to perform binary arithmetic encoding. However, Official Notice is taken that both the concept and advantage of binary arithmetic encoding are notoriously well known and expected in the art,

and therefore would have been obvious to incorporate in the image encoding method for bitstream generation.

Regarding claim 12-13, Joshi and Nafarieh are silent on the limitation of: the assigned quantizer step-size is based on image type and labled .DELTA..sup.I.sub.j. and that the base type quantizer step-size is also based on image type and labled DELTA..sup.B.sub.j. and that the number of bitplanes to discard is a logarithmic ratio of the two aforementioned quantizer step-sizes given by: LOG.base2.(.DELTA..sup.I.sub.j. / DELTA..sup.B.sub.j.). However Official Notice is taken that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Joshi's disclosed quantizer step-sizes and bitplane discard size to take the form of .DELTA..sup.I.sub.j., DELTA..sup.B.sub.j. and LOG.base2.(.DELTA..sup.I.sub.j. / DELTA..sup.B.sub.j.) respectively for the benefit of defining quantizer step-sizes and bitplane discard sizes.

Regarding claim 14-15, Joshi and Nafarieh are silent on modifying and shrinking subband coefficients prior to quantization. However, Official Notice is taken that both the concept and advantage of including modifying and shrinking subband coefficients prior to quantization during the process of image encoding are notoriously well known and expected in the art, and therefore would have been obvious to incorporate for the benefit of streamlining the quantization process during encoding.

Contact

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steve Koziol whose telephone number is (571) 270-1844. The examiner can normally be reached on M - F 9:00-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached at (571) 272-7413 . Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-7332.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/srk/

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624